

## REMARKS

Claims 1-25 and 27-44 remain in the present application. Claims 1, 5, 9, 11, 15, 18, 21, 25, 28, 30, 32 and 39 are amended herein. Applicants respectfully submit that no new matter has been added as a result of the claim amendments. Applicants respectfully request further examination and reconsideration of the rejections based on the arguments set forth below.

### Allowable Subject Matter

Applicants would like to thank the Examiner for the indication that Claims 24, 36-37 and 43-44 would be allowable if rewritten in independent form.

### Claim Rejections – 35 U.S.C. §103

#### Claims 28-30

Claims 28-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over United States Patent Number 6,188,394 to Morein et al. (hereafter referred to as "Morein") in view of "Fast Spheres, Shadows, Textures, Transparencies, and Image Enhancements in Pixel-Planes" by Fuchs et al. (hereafter referred to as "Fuchs"). Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 28-30 are not rendered obvious by Morein in view of Fuchs for the following reasons.

Applicants respectfully direct the Examiner to independent Claim 28 that recites a method for reading a frame buffer comprising (emphasis added):

receiving an address corresponding to a pixel, said address associated with a virtual frame buffer;  
transforming the received address into multiple subpixel addresses;  
reading at least two subpixels from the frame buffer using at least two of the multiple subpixel addresses, wherein the frame buffer comprises a plurality of pixels, wherein each pixel comprises a plurality of subpixels; and

blending the at least two subpixels to create a pixel value for said pixel.

Independent Claim 30 recites limitations similar to those of independent Claim 28. Claim 29 depends from independent Claim 28 and recites further limitations to the claimed invention.

Applicants respectfully assert that Morein fails to teach or suggest the limitations of “said address associated with a virtual frame buffer” as recited in independent Claim 28. As recited and described in the present application, a recited address corresponding to a pixel is associated with a virtual frame buffer (e.g., virtual frame buffer 304 of Figures 4 and 5 of the present application).

In contrast to the claimed embodiments, Applicants fail to find any teaching or suggestion in Morein of a virtual frame buffer as claimed. Moreover, page 5 of the rejection states that Morein fails to teach or suggest a virtual frame buffer as claimed. Applicants concur and respectfully assert that Morein therefore fails to teach an address associated with a virtual frame buffer as claimed.

Applicants respectfully assert that Fuchs, either alone or in combination with Morein, fails to cure the deficiencies of Morein discussed above. Specifically, Applicants respectfully assert that Fuchs, either alone or in combination with Morein, also fails to teach or suggest the limitations of “said address associated with a virtual frame buffer” as recited in independent Claim 28.

Additionally, Applicants respectfully submit that no suggestion or motivation to combine Morein and Fuchs in the claimed fashion has been shown

sufficiently to establish a *prima facie* case of obviousness, as discussed in MPEP §2143. Applicants respectfully submit that neither Morein nor Fuchs, either explicitly or inherently, provide a motivation or suggestion to combine the two references in the claimed fashion. Moreover, the references explicitly teach away from the combination. For example, Morein is directed to compressing and reducing the size of pixel sample sets to conserve memory resources (col. 2, lines 10-26), while Fuchs is directed to a costlier algorithm with increased sample size and multiple memories to enable successive refinement of the image over several passes (pages 119-120). As such, Applicants respectfully submit that one would not be motivated to combine Morein's invention directed to conserving memory resources and reducing sampling size with Fuchs' algorithm which is more costly, requires an increased sample size, and requires more memory resources to implement the algorithm. Consequently, Applicants respectfully assert that one of ordinary skill in the art would not be motivated to combine Morein and Fuchs in the claimed fashion.

Further, although page 3 of the rejection states that "Fuchs is merely used for its teaching of transforming the address into multiple subpixel addresses," Applicant respectfully reminds the Examiner that "all teachings in the prior art must be considered" (MPEP §2143.01). As such, portions of Fuchs which teach away from Morein should be considered when evaluating the alleged motivation to combine.

Moreover, the teachings of Fuchs which teach away from the combination with Morein should not be separated and/or ignored as subpixel addresses taught by Fuchs are a function of an offset (e.g., xoffset and yoffset) used in the features which add to the cost, sample size, memory resources, and the like.

For example, Fuchs teaches that “each subpixel has an address of the form (x+xoffset, y+yoffset)” and that “[w]e generate the image several times (16, perhaps), each time offsetting the image slightly by some (xoffset, yoffset)” (page 119, second column, fourth paragraph). Fuchs then teaches that two color buffers are maintained, one for image data related to a current image and the other for storing image data related to an average of past images considered in each of the previous passes (page 119, second column, fourth paragraph), where “[t]he extra cost of the algorithm... is the color blending between each pass” (page 120, first column, first paragraph). Thus, the features that add cost (e.g., maintaining two color buffers, performing averaging for each pass, performing multiple passes, etc.) are related to the determination of the subpixel addresses, and as such, should not be ignored when evaluating the motivation to combine. Therefore, Applicants reiterate that one of ordinary skill in the art would not be motivated to combine Morein and Fuchs in the claimed fashion.

For these reasons, Applicants respectfully assert that independent Claim 28 is not rendered obvious by Morein in view of Fuchs, thereby overcoming the 35 U.S.C. §103(a) rejections of record. Since independent Claim 30 recites limitations similar to those discussed above with respect to independent Claim 28, independent Claim 30 also overcomes the 35 U.S.C. §103(a) rejection of record. Since dependent Claim 29 recites further limitations to the invention claimed in independent Claim 28, dependent Claim 29 is also not rendered obvious by Morein in view of Fuchs. Therefore, Claims 28-30 are allowable.

Claims 1-4, 9-10, 13, 15-17, 19, 21-23 and 32-35

Claims 1-4, 9-10, 13, 15-17, 19, 21-23 and 32-35 are rejected under 35 U.S.C. §103(a) as being unpatentable over Morein in view of United States

Patent Number 6,366,289 to Johns (hereafter referred to as "Johns"). Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 1-4, 9-10, 13, 15-17, 19, 21-23 and 32-35 are not rendered obvious by Morein in view of Johns for the following reasons.

Applicants respectfully direct the Examiner to independent Claim 1 that recites a method for providing antialiased memory access comprising (emphasis added):

receiving a request to access a memory address; and  
determining if the memory address is within a virtual frame buffer  
and, if so, performing the following:  
transforming the memory address into at least one physical  
address within a frame buffer utilized for antialiasing, wherein said  
at least one physical address is associated with a plurality of  
subpixels and generated using a virtual frame buffer, wherein said  
frame buffer is a single memory comprising data associated with  
said plurality of subpixels, wherein said plurality of subpixels  
correspond to at least one pixel of said virtual frame buffer; and  
accessing data associated with a subpixel at the at least one  
physical address within the frame buffer.

Independent Claims 9, 15, 21 and 32 recite limitations similar to independent Claim 1. Claims 2-4, 10, 13, 16-17, 19, 22, 23 and 33-35 depend from their respective independent Claims and recite further limitations to the claimed invention.

Applicants respectfully assert that Morein fails to teach or suggest the limitations of "transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing" as recited in independent Claim 1. As recited and described in the present application, a memory address is transformed into at least one physical address within a frame buffer utilized for antialiasing.

In contrast to the claimed embodiments, Applicants understand Morein to teach that a frame buffer comprises pointers to a selected address in a sample memory (col. 2, lines 19-21). However, Applicants respectfully assert that merely storing a pointer as taught by Morein is not the same as transforming a memory address into a physical address as claimed. Accordingly, Applicants reiterate that Morein fails to teach or suggest the limitations of “transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing” as recited in independent Claim 1.

Applicants respectfully assert that Johns, either alone or in combination with Morein, also fails to teach or suggest the limitations of “transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing” as recited in independent Claim 1. In contrast to the claimed embodiments, Applicants fail to find any teaching or suggestion in Johns of a framebuffer utilized for antialiasing as claimed. Accordingly, Applicants reiterate that Johns, either alone or in combination with Morein, also fails to teach or suggest the limitations of “transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing” as recited in independent Claim 1.

Applicants respectfully assert that Morein fails to teach or suggest the limitations of “wherein said at least one physical address is associated with a plurality of subpixels and generated using a virtual frame buffer” as recited in independent Claim 1. As recited and described in the present application, the at least one physical address is associated with a plurality of subpixels and generated using a virtual frame buffer.

In contrast to the claimed embodiments, Applicants fail to find any teaching or suggestion in Morein of a virtual frame buffer as claimed. Moreover, page 5 of the rejection states that Morein fails to teach or suggest a virtual frame buffer as claimed. Applicants concur and respectfully assert that Morein therefore fails to teach at least one physical address associated with a plurality of subpixels and generated using a virtual frame buffer as claimed.

Applicants respectfully assert that Johns, either alone or in combination with Morein, also fails to teach or suggest the limitations of “wherein said at least one physical address is associated with a plurality of subpixels and generated using a virtual frame buffer” as recited in independent Claim 1. In contrast to the claimed embodiments, Applicants understand Johns to teach a virtual frame buffer for generating physical addresses associated with pixels. A physical address associated with a pixel as taught by Johns is not the same as a physical address associated with a subpixel as claimed since a pixel is different from a subpixel. For example, a subpixel may comprise a portion of pixel, and one or more subpixels may be used to determine a value for the pixel. Accordingly, Applicants respectfully assert that Johns teaches away from the claimed embodiments by teaching generation of physical addresses associated with pixels instead of physical addresses associated with subpixels as claimed.

For these reasons, Applicants respectfully submit that independent Claim 1 is not rendered obvious by Morein in view of Johns, thereby overcoming the 35 U.S.C. §103(a) rejections of record. Since independent Claims 9, 15, 21 and 32 contain limitations similar to those discussed above with respect to independent Claim 1, independent Claims 9, 15, 21 and 32 also overcome the 35 U.S.C. §103(a) rejections of record. Since dependent Claims 2-4, 10, 13, 16-17, 19, 22-

23 and 33-35 recite further limitations to the invention claimed in their respective independent Claims, dependent Claims 2-4, 10, 13, 16-17, 19, 22-23 and 33-35 are also not rendered obvious by Morein in view of Morein. Therefore, Claims 1-4, 9-10, 13, 15-17, 19, 21-23 and 32-35 are allowable.

Claims 5-6, 11-12, 18 and 25

Claims 5-6, 11-12, 18 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Morein in view of Johns, and further in view of United States Patent Number 5,664,162 to Dye (hereafter referred to as "Dye"). Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 5-6, 11-12, 18 and 25 are not rendered obvious by Morein in view of Sturges and further in view of Dye for the following reasons.

Page 9 of the rejection states that both Morein and Johns fail to teach or suggest the limitations of providing a pitch value of the frame buffer as recited in Claim 5, and similarly recited in Claims 11, 18 and 25. Applicants concur and respectfully assert that both Morein and Johns also fail to teach or suggest the limitations of "wherein said pitch value comprises a distance between two of said plurality of subpixels" as recited in Claim 3, and similarly recited in Claims 11, 18 and 25.

Applicants respectfully assert that Dye, either alone or in combination with Morein and/or Johns, also fails to teach or suggest the limitations of "wherein said pitch value comprises a distance between two of said plurality of subpixels" as recited in Claim 3, and similarly recited in Claims 11, 18 and 25. In contrast to the claimed embodiments, Applicants understand Dye to teach a pitch value



based upon *pixels*. Applicants respectfully assert that a pitch value based upon pixels is not the same as a pitch value associated with *subpixels* as claimed. Accordingly, Applicants respectfully assert that Dye fails to teach or suggest a pitch value *comprising a distance between two of said plurality of subpixels* as claimed.

Additionally, Applicants respectfully submit that Dye, either alone or in combination with Morein and/or Johns, fails to cure the deficiencies of the Morein/Johns combination discussed above with respect to independent Claims 1, 9, 15 and 21. Specifically, Applicants respectfully submit that Dye also fails to teach or suggest “transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing” and “wherein said at least one physical address is associated with a plurality of subpixels and generated using a virtual frame buffer” as recited in independent Claims 1, 9, 15 and 21. Consequently, since Claims 5-6, 11-12, 18 and 25 recite further limitations to the invention claimed in their respective independent Claims, Claims 5-6, 11-12, 18 and 25 are not rendered obvious by Morein in view of Johns and further in view of Dye. Thus, Claims 5-6, 11-12, 18 and 25 overcome the 35 U.S.C. §103(a) rejections of record, and are therefore allowable.

Claims 7-8, 14, 20, 27 and 38-42

Claims 7-8, 14, 20, 27 and 38-42 are rejected under 35 U.S.C. §103(a) as being unpatentable over Morein in view of Johns, and further in view of United States Patent Number 5,594,854 to Baldwin et al. (hereafter referred to as “Baldwin”). Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claims 7-8,

14, 20, 27 and 38-42 are not rendered obvious by Morein in view of Johns and further in view of Baldwin for the following reasons.

Page 10 of the rejection states that both Morein and Johns fail to teach or suggest the limitations of subpixels having physical addresses nearby one another as recited in Claim 7, and similarly recited in Claims 14, 20, 27 and 38. Applicants concur.

Applicants respectfully assert that Baldwin, either alone or in combination with Morein and/or Johns, also fails to teach or suggest the limitations of “wherein said plurality of subpixels corresponding to said pixel of said virtual frame buffer have physical addresses that are nearby each other” as recited in Claim 7, and similarly recited in Claims 14, 20, 27, 38 and 39. In contrast to the claimed embodiments, Applicants understand Baldwin to merely teach contiguous physical memory (col. 18, lines 40-44). However, Baldwin fails to teach *subpixels* having physical addresses that are nearby each other as claimed. Further, Baldwin also fails to teach or suggest subpixels *corresponding to said pixel of said virtual frame buffer* having physical addresses that are nearby each other as claimed.

Additionally, Applicants respectfully submit that Baldwin, either alone or in combination with Morein and/or Johns, fails to cure the deficiencies of the Morein/Johns combination discussed above with respect to independent Claims 1, 9, 15, 21 and 32. Specifically, Applicants respectfully submit that Baldwin also fails to teach or suggest the limitations of “transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing” and “wherein said at least one physical address is associated with a plurality of

subpixels and generated using a virtual frame buffer” as recited in independent Claims 1, 9, 15, 21 and 32, and similarly recited in independent Claim 39. Consequently, since Claims 7-8, 14, 20, 27, 38 and 40-42 recite further limitations to the invention claimed in their respective independent Claims, Claims 7-8, 14, 20, 27, 38 and 40-42 are not rendered obvious by Morein in view of Johns and further in view of Baldwin. Thus, Claims 7-8, 14, 20, 27 and 38-42 overcome the 35 U.S.C. §103(a) rejections of record, and are therefore allowable.

#### Claim 31

Claims 31 is rejected under 35 U.S.C. §103(a) as being unpatentable over Morein in view of Fuchs, and further in view of United States Patent Number 7,158,148 to Toji et al. (hereafter referred to as “Toji”). Applicants have reviewed the cited references and respectfully submit that the embodiments of the present invention as recited in Claim 31 are not rendered obvious by Morein in view of Fuchs and further in view of Toji for the following reasons.

Applicants respectfully submit that Toji, either alone or in combination with Morein and/or Fuchs, fails to cure the deficiencies of the Morein/Fuchs combination discussed above with respect to independent Claim 30. Specifically, Applicants respectfully submit that Toji also fails to teach or suggest “said address associated with a virtual frame buffer” as recited in independent Claim 30. Consequently, since Claim 31 recites further limitations to the invention claimed in independent Claim 30, Claim 31 is not rendered obvious by Morein in view of Fuchs and further in view of Toji. Thus, Claim 31 overcomes the 35 U.S.C. §103(a) rejections of record, and is therefore allowable.

### CONCLUSION

Applicants respectfully submit that Claims 1-25 and 27-44 are in condition for allowance and Applicants earnestly solicit such action from the Examiner.

The Examiner is urged to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present application.

Please charge any additional fees or apply any credits to our PTO deposit account number: 50-4160.

Respectfully submitted,

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